5.7 Noise

5.7.1 Introduction

The Applicant proposes to develop a solar energy project called the Ivanpah Solar Electric Generating System (Ivanpah SEGS). It will be located in southern California's Mojave Desert, near the Nevada border, to the west of Ivanpah Dry Lake. The project will be located in San Bernardino County, California, on federal land managed by the Bureau of Land Management (BLM). It will be constructed in three phases: two 100-MW phases (known as Ivanpah 1 and 2) and a 200-MW phase (Ivanpah 3). The phasing is planned so that Ivanpah 1 (the southernmost site) will be constructed first, followed by Ivanpah 2 (the middle site), then Ivanpah 3 (the 200-MW plant on the north), though the order of construction may change. Each 100-MW site requires about 850 acres (or 1.3 square miles); the 200-MW site is about 1,660 acres (or about 2.6 square miles). The total area required for all three phases, including the Administration/Operations and Maintenance building and substation, is approximately 3,400 acres. The Applicant has applied for a right-of-way grant for the land from BLM. Although this is a phased project, it is being analyzed as if all phases are operational.

The heliostat (or mirror) fields focus solar energy on the power tower receivers near the center of each of the heliostat arrays (the 100-MW plants have three arrays and the 200-MW plant has four arrays). In each plant, one Rankine-cycle reheat steam turbine receives live steam from the solar boilers and reheat steam from one solar reheater—located in the power block at the top of its own tower. The solar field and power generation equipment are started each morning after sunrise and insolation build-up, and shut down in the evening when insolation drops below the level required to keep the turbine online.

Ivanpah 1, 2 and 3 will be interconnected to the Southern California Edison (SCE) grid through upgrades to SCE's 115-kV line passing through the site on a northeast-southwest right-of-way. These upgrades will include the construction by SCE of a new 220/115-kV breaker-and-a-half substation between the Ivanpah 1 and 2 project sites. This new substation and the 220-kV upgrades will be for the benefit of Ivanpah and other Interconnection Customers in the region. The existing 115-kV transmission line from the El Dorado substation will be replaced with a double-circuit 220-kV overhead line that will be interconnected to the new substation. Power from Ivanpah 1, 2 and 3 will be transmitted at 115 kV to the new substation. SCE plans to add three new 115-kV lines to increase capacity to the existing El Dorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115-kV line heading southwest. The timing of this upgrade depends upon the development of wind projects ahead in the queue, and is not affected by the Ivanpah SEGS project.

Each phase of the project includes a small package natural gas-fired start-up boiler to provide heat for plant start-up and during temporary cloud cover. The project's natural gas system will be connected to the Kern River Gas Transmission Line, which passes less than half a mile to the north of the project site. Raw water will be drawn daily from one of two onsite wells, located east of Ivanpah 2. Each well will have sufficient capacity to supply water for all three phases. Groundwater will go through a treatment system for use as boiler make-up water and to wash the heliostats. To save water in the site's desert environment, each plant will use a dry-cooling condenser. Water consumption is, therefore, minimal

(estimated at no more than 100 acre-feet/year for all three phases). Each phase includes a small onsite wastewater plant located in the power block that treats wastewater from domestic waste streams such as showers and toilets. A larger sewage package treatment plant will also be located at the Administration Building/Operations and Maintenance area, located between Ivanpah 1 and 2. Sewage sludge will be removed from the site by a sanitary service provider. No wastewater will be generated by the system, except for a small stream that will be treated and used for landscape irrigation. If necessary, a small filter/purification system will be used to provide potable water at the Administration Building.

This subsection describes the applicable laws, ordinances, regulations, and standards (LORS) and the environmental setting. It provides an analysis of the project impacts that could occur as a result of project construction and operation. It also presents protection and mitigation measures that would avoid, minimize, or compensate for adverse impacts when required. At the end of the subsection is a list of agency contracts and permits that would be required.

5.7.2 Laws, Ordinances, Regulations, and Standards

The following are the LORS that apply to noise generated by the project. They are discussed below and summarized in Table 5.7-1.

5.7.2.1 Federal LORS

5.7.2.1.1 U.S. Environmental Protection Agency

Guidelines are available from the U.S. Environmental Protection Agency (EPA, 1974) to assist state and local government entities in development of state and local LORS for noise. Because there are local LORS that apply to this project, the EPA guidelines are not applicable.

5.7.2.1.2 Occupational Safety and Health Act

Onsite noise levels are regulated, in a sense, through the Occupational Safety and Health Act of 1970 (OSHA). The noise exposure level of workers is regulated at 90 decibels, A-weighted (dBA), over an 8-hour work shift to protect hearing (29 Code of Federal Regulations [CFR] 1910.95). Onsite noise levels will generally be in the 70- to 85-dBA range. Areas above 85 dBA will be posted as high noise level areas and hearing protection will be required. The power plant will implement a hearing conservation program for applicable employees and maintain 8-hour exposure levels below 90 dBA.

5.7.2.2 State LORS

5.7.2.2.1 California Occupational Safety and Health Administration

The California Department of Industrial Relations, Division of Occupational Safety and Health enforces California Occupational Safety and Health Administration (Cal-OSHA) regulations, which are the same as the federal OSHA regulations described previously. The regulations are contained in Title 8 of the California Code of Regulations (CCR), General Industrial Safety Orders, Article 105, Control of Noise Exposure, Sections 5095, et seq.

TABLE 5.7-1
Laws, Ordinances, Regulations, and Standards for Ivanpah SEGS Noise

LORS	Requirements/ Applicability	Administering Agency	AFC Section Explaining Conformance
Federal			
EPA	Guidelines for state and local governments.	EPA	Section 5.7.2.1.1.
OSHA	Exposure of workers over 8-hour shift limited to 90 dBA.	OSHA	Sections 5.7.2.1.2, 5.7.5.2.1, and 5.7.5.3.1. Also see Section 5.16, Worker Safety
State			
Cal-OSHA 8 CCR Article 105 Sections 095 et seq.	Exposure of workers over 8-hour shift limited to 90 dBA.	Cal-OSHA	Sections 5.7.2.2.1, 5.7.5.2.1, and 5.7.5.3.1. Also see Section 5.16, Worker Safety
Calif. Vehicle Code Sections 23130 and 23130.5	Regulates vehicle noise limits on California highways.	Caltrans, California Highway Patrol and the County Sheriff's Office	Delivery trucks and other vehicles will meet Code requirements.
Local			
California Government Code Section 65302	Requires local government to prepare plans that contain noise provisions.	San Bernardino County	Section 5.7.2.3.
San Bernardino County General Plan	Refers to the County Development Code which establishes noise limits based on receiving land use.	San Bernardino County	Sections 5.7.2.3 and 5.7.5.3.4.
San Bernardino County Development Code	Chapter 83.01 of the County Development Code establishes performance standards that noise sources should achieve at existing or planned residential or other noise-sensitive land uses.	San Bernardino County	Sections 5.7.2.3 and 5.7.5.3.4.

5.7.2.2.2 California Vehicle Code

Noise limits for highway vehicles are regulated under the California Vehicle Code, Sections 23130 and 23130.5. The limits are enforceable on the highways by the California Highway Patrol and the County Sheriff's Office.

5.7.2.3 Local LORS

The California State Planning Law (California Government Code Section 65302) requires that all cities, counties, and entities (such as multi-city port authorities) prepare and adopt a General Plan to guide community change. Because the project is located within San Bernardino County, only San Bernardino County has jurisdiction over the project.

5.7.2.3.1 San Bernardino County

The San Bernardino County 2007 General Plan Noise Element states noise levels shall not exceed performance standards listed in Chapter 83.01 of the County Development Code at

the boundary of areas planned or zoned for residential or other noise-sensitive land uses. Table 5.7-2 summarizes the performance standards identified in Chapter 83.01 of the County Development Code. However, since the County does not have jurisdiction over the project, these noise standards do not apply.

TABLE 5.7-2
Noise Standards for Stationary Noise Sources, San Bernardino County

Affected Land Uses (Receiving Noise)	7 am-10 pm L_{eq} (dBA)	10 pm-7 am L_{eq} (dBA)
Residential	55	45
Professional Services	55	55
Other Commercial	60	60
Industrial	70	70

Source: San Bernardino County Development Code Table 83-2
http://www.co.san-bernardino.ca.us/landuseservices/DevCode/Default.asp

The above limits are adjusted as follows for short-term noise events:

- The noise standard plus 5 dBA for a cumulative period of more than 15 minutes in any hour.
- The noise standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour.
- The noise standard plus 15 dBA for a cumulative period of more than one minute in any hour.
- The noise standard plus 20 dBA for any period of time.

If the noise consists entirely of impact noise or simple tone noise, the allowable level shall be reduced by 5 dBA.

Temporary construction, maintenance, repair or demolition activities conducted between the hours of 7:00 a.m. and 7:00 p.m., except Sundays and federal holidays are exempt from the above limits.

5.7.3 Fundamentals of Acoustics

Acoustics is the study of sound, and noise is defined as unwanted sound. Airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure creating a sound wave. Acoustical terms used in this subsection are summarized in Table 5.7-3.

TABLE 5.7-3
Definitions of Acoustical Terms

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise or sound at a given location. The ambient level is typically defined by the L_{eq} level.
Background Noise Level	The underlying ever-present lower level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as traffic, typically makeup the background. The background level is generally defined by the L_{90} percentile noise level.
Intrusive	Noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, tonal content, the prevailing ambient noise level as well as the sensitivity of the receiver. The intrusive level is generally defined by the L_{10} percentile noise level.
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
A-Weighted Sound Level (dBA)	The sound level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Equivalent Noise Level (L_{eq})	The average A-weighted noise level, on an equal energy basis, during the measurement period.
Percentile Noise Level (L_n)	The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (e.g., L_{90})

The most common metric is the overall A-weighted sound level measurement that has been adopted by regulatory bodies worldwide. The A-weighting network measures sound in a similar fashion to how a person perceives or hears sound, thus achieving very good correlation in terms of how to evaluate acceptable and unacceptable sound levels.

A-weighted sound levels are typically measured or presented as equivalent sound pressure level (L_{eq}), which is defined as the average noise level, on an equal energy basis for a stated period of time and is commonly used to measure steady state sound or noise that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by $L_{xx,}$ where xx represents the percentile of time the sound level is exceeded. The L_{90} is a measurement that represents the noise level that is exceeded during 90 percent of the measurement period. Similarly, the L_{10} represents the noise level exceeded for 10 percent of the measurement period.

The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, learning
- Physiological effects such as startling and hearing loss

In most cases, environmental noise may produce effects in the first two categories only. However, workers in industrial plants may experience noise effects in the last category. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is primarily due to the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparing it to the existing or "ambient" environment to which that person has adapted. In general, the more the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

Table 5.7-4 shows the relative A-weighted noise levels of common sounds measured in the environment and in industry for various sound levels.

TABLE 5.7-4
Typical Sound Levels Measured in the Environment and Industry

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
Shotgun (at shooter's ear)	140	Carrier flight deck	Painfully loud
Civil defense siren (100 feet)	130		
Jet takeoff (200 feet)	120		Threshold of pain
Loud rock music	110	Rock music concert	
Pile driver (50 feet)	100		Very loud
Ambulance siren (100 feet)	90	Boiler room	
Pneumatic drill (50 feet)	80	Noisy restaurant	
Busy traffic; hair dryer	70		Moderately loud
Normal conversation (5 feet)	60	Data processing center	
Light traffic (100 feet); rainfall	50	Private business office	
Bird calls (distant)	40	Average living room library	Quiet
Soft whisper (5 feet); rustling leaves	30	Quiet bedroom	
	20	Recording studio	
Normal breathing	10		Threshold of hearing

Source: Beranek, 1998.

5.7.4 Affected Environment

The project site is located in northeastern San Bernardino County off Interstate 15 (I-15) about 3.1 miles south of the California–Nevada border (see Figure 1.2-2). Land uses in the vicinity of the project area are largely BLM-managed open space. Utility corridors are located throughout the BLM property and within the project site.

The closest community is Primm, Nevada, with a population of 436, located approximately 4.5 miles northeast of the project area. Las Vegas, Nevada is located approximately 48 miles to the north. The city of San Bernardino is located approximately 145 miles southwest of the site and Edwards Air Force Base is located approximately 145 west, southwest.

The Primm Valley Golf Course is located east of Ivanpah 2. The Ivanpah Dry Lake is located east of the project site and is bisected by I-15.

5.7.4.1 Ambient Noise Survey

There are no residences, hospitals, libraries, schools, places of worship, or other facilities where quiet is an important attribute of the environment within the area potentially impacted by the proposed project. The closest community Primm, Nevada is approximately 4.5 miles to the northeast of the project area, adjacent to I-15. Primm is also located about 1 mile from the 580-MW Bighorn combined-cycle power plant. In addition, the solar nature of the facility limits its primary operations and noise generating activities to the daylight hours when ambient levels are typically highest. Given operating characteristics and vast distance to the closest sensitive receptor, an increase of 5 dBA or more at a sensitive receptor resulting from construction or operational activities is not anticipated. Presuming an average noise level of 90 dBA at 50 feet (the upper range for construction equipment), the resulting level at 5 miles would be less than 25 dBA. Operational noise levels are anticipated to be less than 30 dBA. Given these low project levels and the daytime operating profile of the project, an ambient noise survey is not warranted nor required by the California Energy Commission's (CEC) siting regulations (20 CCR, Chapter 5, Article 6, Appendix B, sections (g)(4)(A) and (g)(4)(B)).[1]

5.7.5 Environmental Analysis

The construction and operation of Ivanpah SEGS will produce noise, but any increase in noise levels at the closest sensitive receptors will be minimal. Potential noise impacts from construction and operation activities are assessed in this subsection.

5.7.5.1 Significance Criteria

San Bernardino County has established quantitative standards for determining appropriate noise levels for various land use categories. These standards are summarized in Table 5.7-2. Noise impacts may be considered significant by the County if project operational activities conflict with the Noise Level Limits by land use category summarized in Table 5.7-2. However, since the County does not have jurisdiction over the project, their LORS do not apply.

In addition to the County criteria, the CEC staff concluded that a potential for a significance noise impact under the California Environmental Quality Act exists where the noise of the project exceeds the background noise by 5 dBA or more (CEC Data Adequacy Checklist, 2007). It is important to note that the potential for an impact does not mean that there is an impact. Rather, it means that the project noise levels need further evaluation. The CEC staff has also concluded that construction noise is typically insignificant if: (1) the construction activity is temporary; (2) use of heavy equipment and noisy activities are limited to daytime hours; and (3) all feasible noise abatement measures are implemented for noise-producing equipment (CEC, 2002).

[1] Steve Baker of the CEC was consulted regarding the need to conduct ambient monitoring and concurred that if there is not a potential for a 5 dBA increase that monitoring is not required

5.7.5.2 Construction Impacts

This subsection addresses the various components of construction noise and vibration.

5.7.5.2.1 Worker Exposure to Noise

Worker exposure levels during construction of the Ivanpah SEGS will vary depending on the phase of the project and the proximity of the workers to the noise-generating activities. Hearing protection will be available for workers and visitors to use as needed throughout the duration of the construction period. A Hearing Protection Plan, which complies with Cal-OSHA requirements, will be incorporated into the Health and Safety Plan.

5.7.5.2.2 Plant Construction Noise

Construction of Ivanpah SEGS is expected to be similar to other power plants in terms of schedule, equipment used, and other types of activities. The noise level will vary during the construction period, depending upon the construction phase. Construction of power plants can generally be divided into five phases that use different types of construction equipment. The five phases are: (1) demolition, site preparation, and excavation; (2) concrete pouring; (3) steel erection; (4) mechanical; and (5) clean-up (Miller et al., 1978).

Both the EPA Office of Noise Abatement and Control and the Empire State Electric Energy Research Company have extensively studied noise from individual pieces of construction equipment as well as from construction sites of power plants and other types of facilities (EPA, 1971; Barnes et al., 1976). Since specific information on types, quantities, and operating schedules of construction equipment is not available at this point in project development, information from these documents for similarly sized industrial projects will be used. Use of this data, which is between 21 and 26 years old, is conservative since the evolution of construction equipment has been toward quieter designs to protect operators from exposure to high noise levels.

The loudest equipment types generally operating at a site during each phase of construction are presented in Table 5.7-5. The composite average or equivalent site noise level, representing noise from all equipment, is also presented in the table for each phase.

TABLE 5.7-5
Construction Equipment and Composite Site Noise Levels

Construction Phase	Loudest Construction Equipment	Equipment Noise Level (dBA) at 50 feet	Composite Site Noise Level (dBA) at 50 feet	Composite Site Noise Level (dBA) at 5 miles
Demolition, Site Clearing, and Excavation	Dump truck Backhoe	91 85	89	35
Concrete Pouring	Truck Concrete mixer	91 85	78	24
Steel Erection	Derrick crane Jack hammer	88 88	87	33
Mechanical	Derrick crane Pneumatic tools	88 86	87	33
Cleanup	Rock drill Truck	98 91	89	35

Source: EPA, 1971; Barnes et al., 1976.

Table 5.7-6 presents noise levels from common construction equipment at various distances. These results are conservative since the only attenuating mechanism considered was divergence of the sound waves in open air. At a distance of 1 mile, atmospheric and other attenuation would result in at least another 7 dBA reduction and at 5 miles an additional 14 dBA reduction. Construction noise is not anticipated to be noticeable in Primm, with the potential exception of pile driving, which (if required) is not anticipated to exceed current noise exposure levels.

TABLE 5.7-6
Noise Levels from Common Construction Equipment at Various Distances

Construction Equipment	Typical Sound Pressure Level (dBA)			
	50 feet	1,500 feet	1 mile	5 miles
Pile drivers (20,000-32,000 ft-lb/blow)	104	74	64	50
Dozer (250-700 hp)	88	58	48	34
Front end loader (6-15 cu. yds.)	88	58	48	34
Trucks (200-400 hp)	86	56	46	32
Grader (13 to 16 ft. blade)	85	55	45	31
Shovels (2-5 cu. yds.)	84	54	44	30
Portable generators (50-200 kW)	84	54	44	30
Derrick crane (11-20 tons)	83	53	43	29
Mobile crane (11-20 tons)	83	53	43	29
Concrete pumps (30-150 cu. yds.)	81	51	41	27
Tractor (3/4 to 2 cu. yds.)	80	50	40	26
Unquieted paving breaker	80	50	40	26
Quieted paving breaker	73	43	33	19

Note: At a distance of 1 mile, atmospheric and other attenuation would result in at least another 7 dBA reduction and at 5 miles an additional 14 dBA reduction.

Noise generated during the testing and commissioning phase of the project is not expected to be substantially different from that produced during normal full-load operation. Starts and abrupt stops are more frequent during this period, but on the whole they are usually short-lived.

5.7.5.2.3 Construction Vibration

Construction vibrations can be divided into three classes, based on the wave form and its source:

Wave form: Impact	Example source: impact pile driver or blasting
Wave form: Steady state	Example source: vibratory pile driver
Wave form: Pseudo steady state	Example source: double acting pile hammer

Because a final geotechnical report has not been prepared, pile driving is currently anticipated and, if required, will be limited to daytime work hours.

5.7.5.3 Operational Impacts

Given the solar nature of this project, activity at night will be limited and primarily maintenance-related and would not represent significant noise sources. The power plant will operate an average of about 10 hours a day, 7 days a week throughout the year, with the exception of a scheduled shutdown in late December for maintenance. The solar field and power generation equipment will be started up each morning after sunrise and insolation build-up, and shut down in the evening when insolation drops below the level required to keep the steam turbine on line. Nighttime activities include mirror washing, water pumping and water treatment.

5.7.5.3.1 Worker Exposure to Operational Noise

Nearly all components will be specified not to exceed near-field maximum noise levels of 90 dBA at 3 feet (or 85 dBA at 3 feet where available as a vendor standard). Since there are no permanent or semi-permanent workstations located near any piece of noisy plant equipment, no worker's time-weighted average exposure to noise should approach the level allowable under OSHA guidelines. Nevertheless, signs requiring the use of hearing protection devices will be posted in all areas where noise levels commonly exceed 85 dBA, such as inside acoustical enclosures. Outdoor levels throughout the plant will typically range from 90 dBA near certain equipment to roughly 65 dBA in areas more distant from any major noise source.

5.7.5.3.2 Plant Operation Noise Levels

A noise model of the proposed Ivanpah SEGS facility has been developed using source input levels derived from field measurements of similar equipment made at other existing plants, data supplied by manufacturers, or information found in the technical literature. The noise levels have been calculated at the golf course and at the closest community, Primm, Nevada. The noise levels presented represent the anticipated steady-state level from the plant with essentially all equipment operating.

Standard acoustical engineering methods were used in the noise analysis. The noise model, CADNA/A by DataKustik GmbH of Munich, Germany is a very sophisticated noise model and enables one to fully model very complex industrial plants. The sound propagation factors used in the model have been adopted from ISO 9613-2 *Acoustics – Sound Attenuation During Propagation Outdoors* and VDI 2714 *Outdoor Sound Propagation*. The model divides the proposed facility into a list of individual point and area noise sources representing each piece of equipment that produces a significant amount of noise. The sound power levels representing the standard performance of each of these components are assigned based either on field measurements of similar equipment made at other existing plants, data supplied by manufacturers, or information found in the technical literature. Using these standard power levels as a basis, the model calculates the sound pressure level that would occur at each receptor from each source after losses from distance, air absorption, blockages, and other factors are considered. The sum of all these individual levels is the total plant level at the modeling point.

The sound power levels, by octave band, used in the model are summarized in Table 5.7-7. As is typical at this stage of a project, this data is preliminary and detailed vendor specifications will ultimately be developed to ensure the project complies with the conditions of certification. For the purposes of this analysis, noise levels for each of the three phases were modeled based on anticipated equipment for the largest phase (200 MW Ivanpah 3).

TABLE 5.7-7
Octave Band Sound Power Levels Used to Model Ivanpah SEGS, dB (Flat)

	Octave Band Center Frequency, Hz									
Plant Component	**31.5**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Transformers	105	111	113	108	108	102	97	92	85	108
Steam Turbine Generator	113	119	117	112	108	104	101	93	87	111
Boiler Feed Water Pumps	101	107	105	104	103	102	101	100	96	108
Auxiliary Boiler	105	105	104	102	99	96	93	90	87	102
Air Cooled Condenser	127	127	126	121	118	118	113	109	102	122

Operational noise from the Ivanpah SEGS is predicted not to exceed 30 dBA in Primm, Nevada and to be less than the County's residential daytime standard of 55 dBA at the golf course.

5.7.5.3.3 Tonal Noise

At the receptor locations modeled here, no significant tones are anticipated.

That is not to say that audible tones are impossible—certain sources within the plant such as transformers, pump motors, fan gearboxes, etc. have been known to sometimes produce significant tones. It is the Applicant's intention to anticipate the potential for audible tones in the design and specification of the plant's equipment and take necessary steps to prevent sources from emitting tones that might be disturbing at the nearest receptors.

5.7.5.3.4 Ground and Airborne Vibration

The equipment that would be used in the proposed project is well balanced and is designed to produce very low vibration levels throughout the life of the project. An imbalance could contribute to ground vibration levels in the vicinity of the equipment. However, vibration-monitoring systems installed in the equipment are designed to ensure that the equipment remains balanced. Should an imbalance occur, the event would be detected and the equipment would automatically shut down.

5.7.5.3.5 Transmission Line and Switchyard Noise Levels

One of the electrical effects of high-voltage transmission lines is corona. Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware due to very high electric field strength at the surface of the metal during certain conditions. Corona may result in radio and television reception interference, audible noise, light, and production of ozone. Corona is generally a principle concern with transmission lines of 345 kV and higher. Noise is also generally associated with foul weather conditions.

Ivanpah 1 and 2 interconnections will be 115 kV, while Ivanpah 3 will be 287 kV. Given the lack of receptors and that power will only be transmitted during daytime hours when ambient noise levels are typically highest and humidity lowest corona noise is not anticipated to be significant.

5.7.6 Cumulative Effects

A cumulative effect refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Pub. Resources Code § 21083; Cal. Code Regs., Title 14, §§ 15064(h), 15065(c), 15130, and 15355). Cumulative projects are described in Section 5.6.7 and include the Desert Xpress Rail Line, improvements to Interstate 15, Las Vegas Valley Water District Pipeline, Southern Nevada Supplemental Airport (Ivanpah Valley Airport), and Table Mountain Wind Generating Facility. Although environmental analyses for most of these projects have not been completed at the time of preparation of this Application for Certification, none of the projects are in close enough proximity to Ivanpah SEGS to create a cumulative effect. The project is unlikely, therefore, to have impacts that would combine cumulatively with other closely related past, present, and reasonably foreseeable future projects.

5.7.7 Mitigation Measures

The following mitigation measures are anticipated to be included in the project.

5.7.7.1 Noise Mitigation Measure #1

The project owner shall establish a telephone number for use by the public to report any significant undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

5.7.7.2 Noise Mitigation Measure #2

Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all legitimate project-related noise complaints.

The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form typically suggested by CEC or functionally equivalent procedure to document and respond to each noise complaint
- Attempt to contact the person(s) making the noise complaint within 24 hours
- Conduct an investigation to attempt to determine the source of noise related to the complaint
- If the noise complaint is legitimate, take all feasible measures to reduce the noise at its source

5.7.7.3 Noise Mitigation Measure #3

Noisy construction work (that causes offsite annoyance as evidenced by the filing of a legitimate noise complaint) shall be restricted to the 7:00 a.m. to 7:00 p.m. time period. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

5.7.8 Involved Agencies and Agency Contacts

Agency contacts relative to noise issues are presented in Table 5.7-8.

TABLE 5.7-8
Agency Contacts for Ivanpah SEGS Noise

Issue	Agency	Contact
Noise	San Bernardino County Land Use Services	Jim Squire Supervising Planner Advanced Planning 385 N. Arrowhead Avenue, 1st Floor San Bernardino, CA 92415-0182 909-387-4180 jsquire@lusd.sbcounty.gov

5.7.9 Permits Required and Permit Schedule

No permits are required for noise; therefore, there is no permit schedule.

5.7.10 References

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